

## 3D Microfabricated Low Loss Reconfigurable Components, Phase II

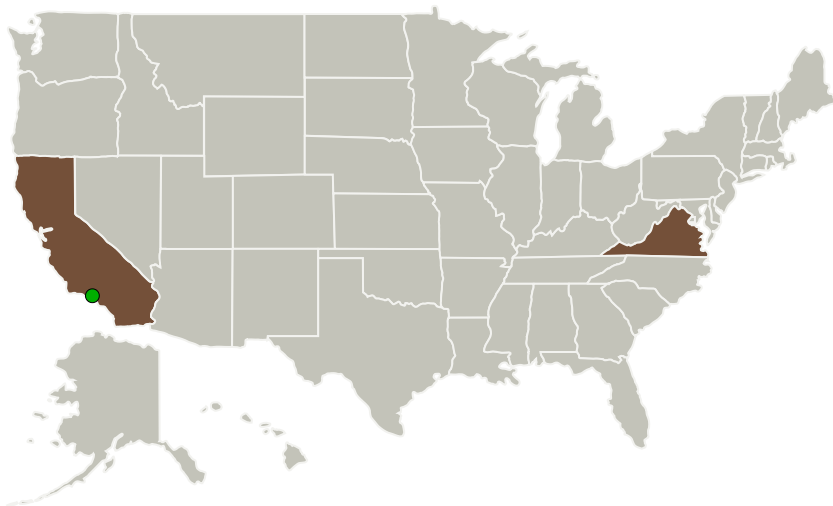
Completed Technology Project (2010 - 2012)



## Project Introduction

Typical communication satellites use traditional waveguide front-end architectures due to the excellent electrical performance and high reliability. While the systems offer excellent performance and reliability they are large and heavy due to incorporation of waveguide-based switches, diplexers, and waveguide packaged solid-state power amplifiers. Replacement of the waveguide components by micromachined parts that provide significant size, weight, and cost reduction without substantially affecting the electrical performance, can lead to a breakthrough in wireless communications. During the Phase I program, Nuvotronics utilized its proprietary PolyStrata™ metal micromachining process to create X and Ka band filters with state-of-the-art performance. During Phase II, tunable filters will be fabricated using the PolyStrata process and tuned using reliable and low actuation voltage MEMS devices. The filters will be designed and tested for space operation and have immediate applications in the Deep Space Network communications system. The PolyStrata process is capable of producing high Q, low weight and therefore compact filters. The PolyStrata process is a new multi-layer technology that creates high quality air loaded copper microdevices. High quality cavity resonator filters can be fabricated using this high precision micro-fabrication process, enabling very high Q filters while being compact, surface mountable and compatible with the integration of active chips.

## Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
Nuvotronics, Inc	Lead Organization	Industry	Radford, Virginia
● Jet Propulsion Laboratory(JPL)	Supporting Organization	NASA Center	Pasadena, California

Primary U.S. Work Locations	
California	Virginia

## Project Transitions

**March 2010:** Project Start**December 2012:** Closed out

**Closeout Summary:** 3D Microfabricated Low Loss Reconfigurable Components, Phase II Project Image

**Closeout Documentation:**

- Final Summary Chart Image(<https://techport.nasa.gov/file/138716>)

## Organizational Responsibility

**Responsible Mission Directorate:**

Space Technology Mission Directorate (STMD)

**Lead Organization:**

Nuvotronics, Inc

**Responsible Program:**

Small Business Innovation Research/Small Business Tech Transfer

## Project Management

**Program Director:**

Jason L Kessler

**Program Manager:**

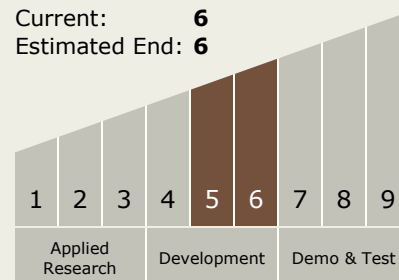
Carlos Torrez

**Principal Investigator:**

Jean Marc Rollin

## Technology Maturity (TRL)

Start: 5  
Current: 6  
Estimated End: 6



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### Technology Areas

#### Primary:

- TX05 Communications, Navigation, and Orbital Debris Tracking and Characterization Systems
  - └ TX05.2 Radio Frequency
    - └ TX05.2.2 Power-Efficiency

### Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System